

Graphic Calculator: Finding when an object hits the ground Or when a diver enters the water

Example: Suppose a diver bounces off a 3-meter high springboard moving upward at a speed of 4 meters per second. Find when the diver will enter the water.

Step 1: write an equation that represents this situation.

$$h = 3 + 4t - 4.9t^2$$

(must use meters formula)

Replace h with 0 since the height above the water is 0 meters when a diver enters it.

$$0 = 3 + 4t - 4.9t^2$$

Step 2: now put TWO equations into the "y =" window on the calculator.

Split $0 = 3 + 4t - 4.9t^2$ into two different equations.

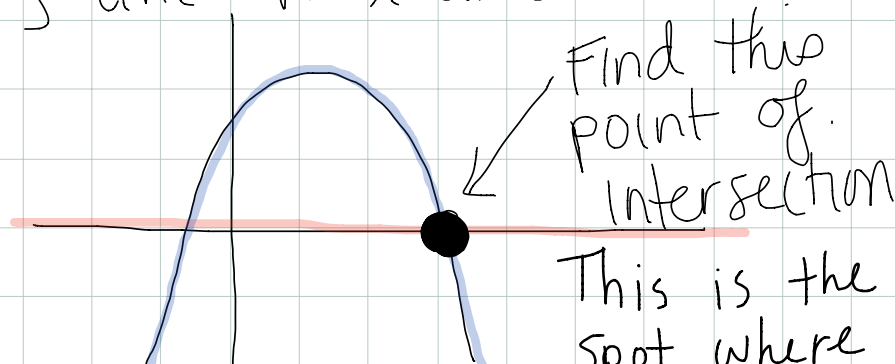
$$y_1 = 3 + 4x - 4.9x^2$$

$$y_2 = 0$$

Step 3: Graph the two equations. Make sure you see a clear view of both

$$y_1 = 3 + 4x - 4.9x^2 \quad \left. \vphantom{y_1 = 3 + 4x - 4.9x^2} \right\} \text{Parabola}$$

$$y_2 = 0 \quad \left. \vphantom{y_2 = 0} \right\} \text{line on x-axis}$$

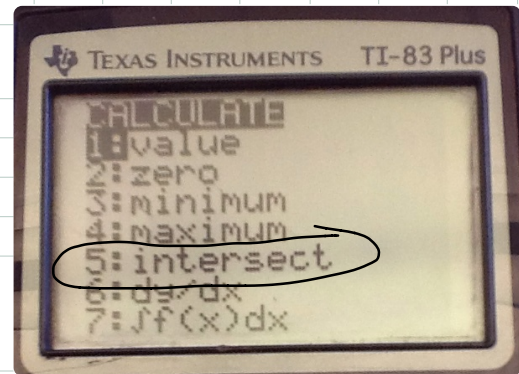


the diver
enters the
water

Step 4: Calculator steps

Press 2nd trace A menu will appear:

Choose 5: intersect



Step 5: When you see "Intersection" is when you have your answer.

The x-value is the time and the y-value is the height.

